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(54) Name of the invention: Marking Sheet

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(71) Patent Assignee: Sekisui Chemical Company

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Explanation of the Invention

1. Name of the Invention

Marking Sheet

2. Scope of the novel claims

1. Marking sheet, which is a marking sheet where on one surface of the sheet substrate material an adhesive agent layer is provided, and on the surface of the above adhesive agent sheet a release paper, which can be peeled off, is layer laminated,

where on the surface of the above release paper, which comes in contact with the adhesive agent layer, a concave-convex pattern is formed, that contains numerous concave and convex parts, and where each of the convex parts of the concave-convex pattern extends to the edge of the sheet substrate material.

3. Detailed explanation of the Invention

(Technological Sphere of the Invention)

The present invention is an invention about a marking sheet (including label), which in order to be glued onto plates, cars etc., different types of

parts etc., materials subject to the adhesion, has an adhesive agent layer provided on one side of the sheet substrate material.

(Previous Technology)

The marking sheet is a material, which can be glued onto the surface of signboard plates, cars, different types of parts etc., materials subject to the adhesion. Usually, at the time when it is not used, an adhesive agent layer is provided on one surface of the sheet substrate material and on the surface of that adhesive agent layer a release paper is glued.

In the past, as the release paper material, it has been possible to use a material, which in order to examine carefully and eliminate and prevent moisture absorption, is a laminated material obtained as polyethylene (here below called PET) is laminated on paper, and silicone is coated on the surface as a release agent. Such laminated material is produced as polyethylene is extruded through an extruder, and it is laminated with paper by using a roll, prior to the solidification of the polyethylene. Through this process, the surface of the polyethylene and the release agent is formed as a smooth surface. Consequently, the surface of the adhesive agent, which comes in contact with the release paper, also becomes a smooth surface.

(Problems Solved by the Present Invention)

However, in the case of metal plates, coated plates, glass plates, resin plates etc., smooth plates, that are used as the materials subject to the adhesion, at the time of the gluing of the marking sheet, there is incorporation of air in the space between the marking sheet and the plate subject to the adhesion. In order to remove the air bubbles incorporated and residing in the space between the marking sheet and the material subject to the adhesion, it has been necessary to poke holes by using a needle and allow the air to escape to the outside, and there has been the problem that it has been stated that the gluing operation efficiency is poor.

The present invention is an invention resolving the above described problem points of the previous technology, and its goal is to suggest a marking sheet where there are no air bubbles residing in the space between the marking sheet and the material subject to the adhesion, and the gluing operation can be conducted easily and simply.

(Measures in Order to Solve the Problem)

Namely, in the case of the marking sheet according to the present invention, it is a marking sheet where on one surface of the sheet substrate material an adhesive agent layer is provided, and on the surface of the above adhesive agent sheet a release paper, which can be peeled off, is layer laminated, and where on the surface of the above release paper, which comes in contact with the adhesive agent layer, a concave-convex pattern is formed, which contains numerous concave and convex parts, and where each of the convex parts of the concave-convex pattern extends to the edge of the sheet substrate material; and by that the above described goal has been achieved.

Regarding the release paper used according to the present invention, usually, it is formed as a resin material is laminated on the front surface of the paper material. As this resin material polyethylene (PE), polypropylene (PP), polyvinyl chloride (PVC), polyethylene terephthalate (PET) etc., thermoplastic type resins are preferably used.

As methods for the application of a concave – convex pattern on the surface of the laminated material, where this resin material and the paper material, are laminated, or on the surface of these resin films, it is possible to use the well-known methods. In the case when PE is used as the resin material, it is preferred that the PE be directly extruded onto the paper material and laminated, and immediately after that be passed in the gap between cooling rolls that have been embossed, through which a concave- convex processing is applied to the front surface of the PE. In the case when as the resin material, PET, PP is used, it is preferred that the concave-convex processing of the surface of the resin layer be conducted by using the sand blasting method.

The convex parts of concave-convex pattern that is formed on the surface of the release paper extend to the edge of the sheet substrate material. This concave-convex pattern may be a stripe pattern with numerous grooves, a pattern with numerous grooves forming a grid type pattern, a checker pattern with projecting corner or round portions, or a polka dot pattern.

In the case when numerous grooves are provided in a checker pattern, it is preferred that the size of the concave-convex parts at the surface of the roll used for the concave-convex processing, be within the range of 50 ~ 300

mesh. In more details, if we use the symbols in Figure 2, which shows a sectional view diagram of the surface of the roll 6, where the width of the convex part 7 on the surface is denoted as a, the width of the opening of the convex part 8, is denoted as b, and the height of the convex part 7 is denoted as c, it is preferred that $a = 15 \text{ microns} \sim 5 \text{ microns}$, $b = 490 \text{ microns} \sim 80 \text{ microns}$, $c = 200 \text{ microns} \sim 15 \text{ microns}$.

After that, on the front surface of the resin that has been subjected to the concave-convex processing, a release agent is coated, and the release paper is produced. For the coating of the release agent, it is preferred to use silicone processing. By that, the coating thickness of the release agent is very small compared to the dimensions of the convex-concave processed parts, and because of that, the concave-convex processing remains on the release paper the way it is.

Accordingly, on the surface of the release agent of the release paper, which has been produced this way, a concave-convex pattern is formed. On the surface of this release paper an adhesive agent is coated and dried and after that, onto that a sheet substrate material is layer laminated and bonded and a marking sheet is obtained.

If the release paper of the produced by this process, marking sheet, is peeled off, a concave-convex pattern, which has the same concave parts and convex parts as the surface of the release paper, is transferred on the surface of the adhesive agent layer. At the time when this marking sheet is glued onto the material that is the subject of the adhesion, when the convex parts of the adhesive agent layer come in contact with the surface of the material that is the subject of the adhesion, the cavity part that is formed in the space between the front surface of the material subject to the adhesion and the convex part, passes through to the edge part of the sheet, and by that, these empty cavity parts are connected and this allows the escape of the air bubbles trapped in the space between the adhesive agent layer and the material subject to the adhesion, to escape to the outside. In the case when the concave-convex pattern at the surface of the adhesive agent layer is smaller than 300 mesh, there is the trend that the escape of the air bubbles is difficult, and in the case when it is larger than 50 mesh, there is the trend that air bubbles remain in the concave parts.

[Effect]

In the case of the marking sheet release paper according to the present invention, a concave-convex pattern is applied onto the surface of the release agent coated laminated material or resin film. On the release paper, which has a concave-convex pattern, an adhesive agent is coated, and, if the release paper is peeled off, its concave-convex pattern is transferred onto the adhesive agent. Namely, the contact surface between the marking sheet and the material subject to the adhesion, is a surface that has a concave-convex pattern. This pattern is grooved such that the concave parts extend continuously to the edge part of the sheet. Consequently, by that, the air that is entrapped in the space between the marking sheet and the material subject to the adhesion, at the time of the gluing, passes through these grooves and it can escape to the outside, and because of that, there are no large air bubbles that are generated in the space between the marking sheet and the material subject to the adhesion.

(Practical Example)

One practical implementation example of the present invention will be explained in details based on the diagram.

Practical Example

Figure 1 is a sectional view diagram showing the structure of a marking sheet this practical implementation example, which has been produced according to the described here below method. On the surface of the paper 1 with a weight of 110 g/m², PE (polyethylene) 2 was extrusion laminated so that its thickness became in the range of 20 ~ 250 microns. Directly after the lamination, by using an embossing roll, which has a 50 ~ 300 mesh concave-convex pattern, on the PE 2 an embossment process is applied producing the convex parts 21 and the concave parts 22. On the surface of PE2, which has been subjected to the embossment processing, the silicone 3 is coated as a release agent, and by that the release paper was produced. On the surface of this release paper the acrylic type adhesive agent 4 was coated so that after drying, its thickness would become in the range of 30 ~ 5 microns. After drying, on the surface of the adhesive agent layer 4, the sheet substrate soft PVC sheet 5 is pressure adhered, and the marking sheet was obtained.

At the time when the release paper of the marking sheet was peeled off, and it was manually glued onto a glass plate, there was no wrinkling of the sheet due to air bubbles.

Reference Example

On the surface of the PE2, which has not undergone embossment, silicone 3 was coated as the release agent, and a release paper was produced. On this release paper, the same way as described according to the Practical Example above, an acrylic type adhesive agent was coated and dried and after that on the adhesive agent layer 4 the soft PVC film 5 was pressure adhered and the marking sheet was obtained.

At the time when the release paper of the obtained marking sheet was peeled off and this sheet was glued onto a glass plate the same way as described according to the practical example, in the space between the sheet and the material subject to the adhesion large air bubbles were generated at several locations. In order to remove these air bubbles an air elimination operation was conducted by using needle.

(Results From the Present Invention)

The marking sheet according to the present invention is a sheet where on a release paper which has a concave-convex pattern, an adhesive agent layer is coated, and because of that if the release paper is peeled off, this concave-convex pattern is transferred onto the adhesive agent layer. Consequently, at the time when this marking sheet is glued onto the material subject to the adhesion, the concave parts that are provided on the adhesive agent layer are connected, and the air bubbles generated in the space between the sheet and the material subject to the adhesion, can escape to the outside, and there is the benefit that it is possible to simply and easily conduct the gluing operation.

4. Brief Explanation of the Figures

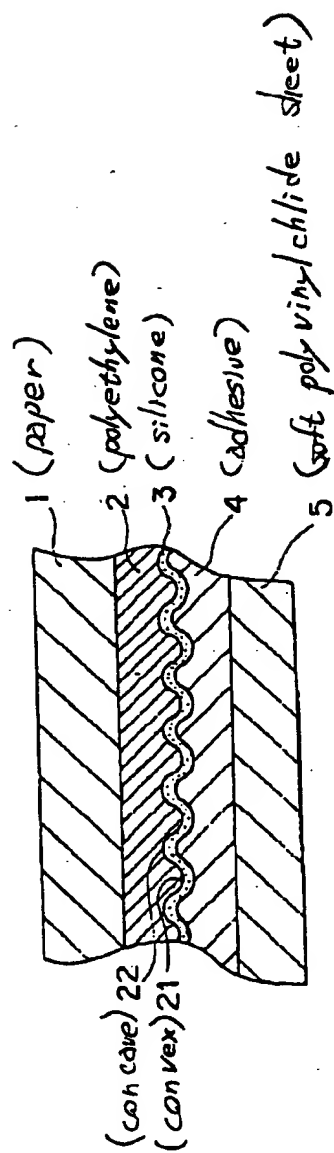
Figure 1 is a sectional view diagram of the essential parts, showing one practical implementation example of the marking sheet according to the present invention. Figure 2 is an explanation diagram in order to explain the concave-convex pattern.

1.....paper, 2.....polyethylene,
3.....silicone, 4.....adhesive agent,

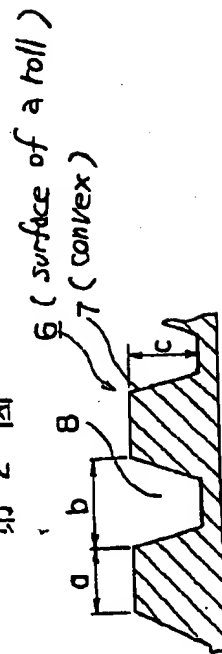
5.....soft polyvinyl chloride sheet, 21.....convex
parts, 22.....concave parts.

Patent Assignee: Sekisui Chemical Company

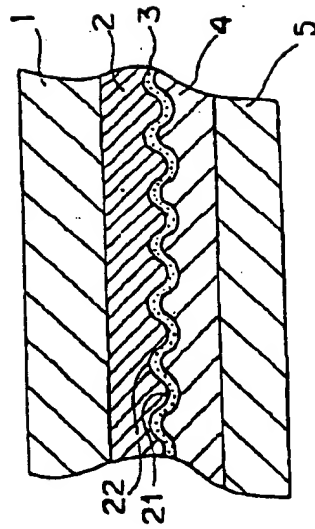
第 1 図



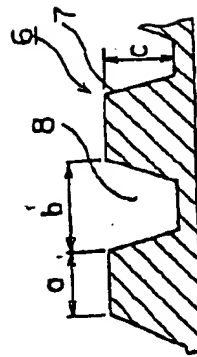
第 2 図



第 1 図



第 2 図



(Withdrawn without request of exdM.)

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7/00
⑨ 発明の名称
マーキングシート

⑩ 実 願 平1-128090
⑪ 出 願 平1(1989)10月31日
⑫ 発 明 人 清水化学工業株式会社
⑬ 出 願 人 清水化学工業株式会社
⑭ 出 願 人 清水化学工業株式会社
⑮ 出 願 人 清水化学工業株式会社

Claim 1.
A marking sheet wherein an adhesive layer is formed at one side of a sheet substrate, and a releasing paper is releasably layered on a surface of said adhesive layer, and furthermore a concave-convex pattern having many concave portions and convex portions is formed on a surface close to said adhesive layer of said releasing paper, and each convex portion of concave-convex pattern continues to the end of said sheet substrate.

明 細 書

1. 考案の名称

マーキングシート

2. 実用新案登録請求の範囲

1. シート基材の片面に粘着剤層が設けられ、該粘着剤層の表面に離型紙が剥離可能に積層されているマーキングシートにおいて、
該離型紙の粘着剤層と接する面には、多数の凹部と凸部を有する凹凸模様が形成され、凹凸模様の各凸部はシート基材の端縁まで達しているマーキングシート。

3. 考案の詳述な説明

(産業上の利用分野)

本発明は、看板、車両、各種部品等の被着体に貼付けられるために、シート基材の片面に粘着剤層が設けられているマーキングシート（ラベルを含む）に関する。

(従来の技術)

マーキングシートとは、看板、車両、各種部品等の被着体の表面に貼付けられるものであって、

通常未使用時にはシート基材の片面に粘着剤層が設けられて、その粘着剤層の表面に離型紙が貼付けられている。

従来、離型紙には、目止め及び吸湿防止のためポリエチレン（以下PEとする）を紙にラミネートしたラミネート材料の表面に、離型剤としてシリコンを塗布したものが用いられてきた。このようなラミネート材料は、押出機によりポリエチレンを押出してポリエチレンが固化する前にロールを用いて紙とラミネートすることによって作製される。よってポリエチレン及び離型剤の表面は平滑面に形成されている。従って、離型紙に接する粘着剤の表面も平滑面となる。

（考案が解決しようとする課題）

しかし、被着体である金属板、塗装板、ガラス板、樹脂板等が平滑版である場合、マーキングシート貼付け時に、マーキングシートと被着板との間に気泡が入り込むことがある。マーキングシートと被着体との間に溜った気泡は脱泡しにくいために、針で穴をあけて気泡を外部へ抜く必要があ

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り、貼付作業性が悪いという問題があった。

本考案は、上記従来の問題点を解決するものであり、その目的は、被着体との間に気泡が溜ることなく、貼付け作業が簡単に済めるマーキングシートを提供することにある。

（課題を解決するための手段）

すなわち本考案のマーキングシートは、シート基材の片面に粘着剤層が設けられ、該粘着剤層の表面に離型紙が剥離可能に積層されているマーキングシートにおいて、該離型紙の粘着剤層と接する面には、多数の凹部と凸部を有する凹凸模様が形成され、凹凸模様の各凸部はシート基材の端縁まで達していて、そのことにより上記目的が達成される。

本考案で用いられる離型紙は、通常、紙の表面に樹脂をラミネートして形成される。その樹脂には、ポリエチレン（PE）、ポリプロピレン（PP）、ポリ塩化ビニル（PVC）、ポリエチレンテレフタレート（PET）等の熱可塑性樹脂が好ましく用いられる。

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This concave-convex pattern may be a stripe pattern having many ditches, a pattern having many ditches in a grid pattern, a checked pattern having projecting cornered portions or projecting round portions, or polka dots.

これらの樹脂を紙とラミネートしたラミネート材料又はこれらの樹脂フィルム表面に、凹凸模様の付ける方法には公知の方法が用いられる。樹脂としてPEを用いる場合、PEを紙の上に押出してラミネートした直後、エンボス加工された冷却ロール間を通すことによってPE表面に凹凸加工を施すことが好ましい。樹脂としてPET、PPを用いる場合、サンドブラスト法により樹脂膜表面に凹凸加工を施すことが好ましい。

離型紙表面に形成された凹凸模様の凸部は、シート基材の端部にまで達している。この凹凸模様は、多数の溝を有するストライプ模様や多数の溝が基盤目状に設けられた模様、角状、丸状の突起部を有する格子模様、水玉模様であってよい。

多数の溝を基盤目状に設ける場合、凹凸加工に用いられるロール表面の凹凸のサイズは、50～300μmが好ましい。具体的には、第2図に示すロール6表面の断面図において凸部7上面の幅をa、凹部8の開口幅をb、凸部7の高さをcとすると、 $a=15\mu m \sim 5\mu m$ 、 $b=490\mu$

$m \sim 80\mu m$ 、 $c=200\mu m \sim 15\mu m$ が好ましい。

次に凹凸加工が施された樹脂膜表面に、離型剤を塗布して離型紙を作製する。離型剤の塗布には、シリコーン加工が好ましい。ここで、離型剤の塗布厚は凹凸加工の寸法に比して非常に小さいので、凹凸加工は、離型紙にそのまま残ることになる。

よって、このようにして作製された離型紙の離型剤表面には、凹凸模様が形成されている。この離型紙の表面に粘着剤を塗布し、乾燥後、これにシート基材を覆層接着してマスキングシートが得られる。

このようにして作製されたマスキングシートの離型紙を剥すと、粘着剤層の表面には離型紙表面と同様に凹部と凸部を有する凹凸模様が転写されている。このマスキングシートを被覆体に貼付けの際、粘着剤層の凸部が被覆体表面に接触したとき、被覆体の表面と凹部との間に形成される空間がシート端部まで通じているので、この空間部を通して、粘着剤層と被覆体との間に入り込

んだ気泡を外部へ逃がすことができる。粘着剤層表面の凹凸模様が300メッシュより小さい場合は、脱泡しにくく、50メッシュより大きい場合は、凹部に気泡が残存しやすい傾向にある。

(作用)

本考案のマーキングシートの離型紙は、離型剤が塗布されたラミネート材料又は樹脂フィルム上に凹凸模様が施されている。凹凸模様を有する離型紙に粘着剤が塗布されるので、離型紙を剥すとき粘着剤にはこの凹凸模様が転写されている。すなわち、マーキングシートの被着体との接触面は凹凸模様を有している。この凹凸模様は、凹部がシート端縁部へ連通する溝のようなものである。よって、マーキングシートを貼付ける際に被着体との間に入り込んだ空気が、この溝を通じてシート外部へ逃げるることができるのでマーキングシートと被着体との間に大きな気泡が生じることがない。

(実施例)

本考案の一実施例を図面に基づいて以下に説明する。

実施例

第1図は、以下に説明する方法で作製された本実施例のマーキングシートの構成を示す断面図である。質量110g/m²の紙1の表面に、PE（ポリエチレン）2を20～250μmの厚みになるように押出ラミネートした。ラミネートした直後に50～300メッシュの凹凸模様が有するエンボスロールで、PE2に凸部21と凹部22とからなるエンボス加工を施した。エンボス加工が施されたPE2の表面に離型剤としてシリコン3を塗布して離型紙を作製した。この離型紙の表面にアクリル系粘着剤4を、乾燥後の厚みが30～5μmとなるように塗布した。乾燥後、粘着剤層4にシート基材である材質PVCシート5を圧着してマーキングシートを得た。

得られたマーキングシートの離型紙を剥して、手でガラス板に貼付けたところ、気泡によるシートのうきはなかった。

比較例

エンボス加工を施さなかったPE2の表面に離

を示す要部断面図、第2図は凹凸模様を説明する
ための説明図である。

- 1...紙、2...ポリエチレン、3...シリコン、
4...粘着剤、5...軟質ポリ塩化ビニルシート、
21...凸部、22...凹部。

以上

出願人 積水化学工業株式会社

代表者 渡田 肇

型剤としてシリコン3を塗布し離型紙を作製した。この離型紙に実施例と同様にしてアクリル系粘着剤を塗布して乾燥後、粘着剤層4に軟質PVCFイルム5を圧着してマーキングシートを得た。得られたマーキングシートの離型紙を剥し、これを実施例と同様にしてガラス板に貼付けたところ、シートと被着体との間に、数ヶ所大きな気泡が生じていた。この気泡を除去するために、針等を用いて脱泡作業をした。

(考察の効果)

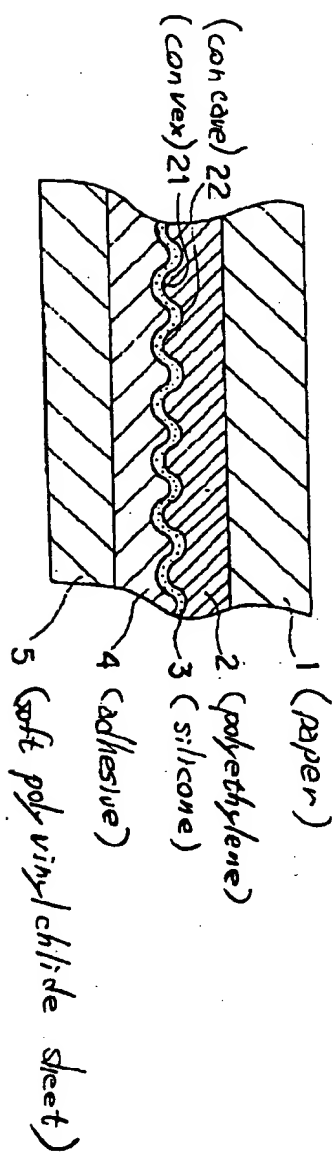
本考察のマーキングシートは、凹凸模様を有する離型紙に粘着剤層が塗布されているので、離型紙を剥すと粘着剤層にはこの凹凸模様が転写されている。従って、このマーキングシートを被着体に貼付ける際、粘着剤層に致けられた凹部を通して、シートと被着体との間に入り込んだ空気を外へ逃がすことができ、貼付け作業が簡便に行えるという利点がある。

4. 図面の簡単な説明

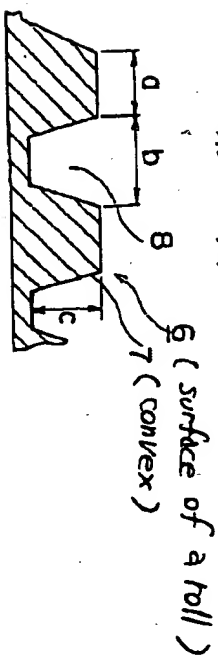
第1図は本考察のマーキングシートの一実施例



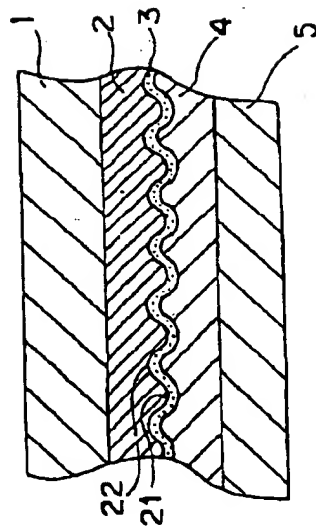
第 1 図



第 2 図



第 1 図



第 2 図

